

APPENDIX 4: Capture and Safe Handling of Whooping Cranes to Avoid Capture-Related Stress and Injury Barry K. Hartup, DVM, PhD (The report below, including a complete set of references, is available from the ICF library as a pdf file by request; contact through website: www.savingcranes.org)

This report provides a general set of guidelines for the safe capture and handling of free-ranging whooping cranes in North America. The target audience consists of aviculturists, biologists and veterinarians that work directly to capture whooping cranes. This report is not intended to provide exhaustive information on specific capture techniques; it is assumed that the methods chosen by the biologists meet the standards of the profession and are appropriate for the situation at hand (for further technique information, see Hayes, et. al., 2003. Capture of sandhill cranes using alpha-chloralose. *Journal of Wildlife Diseases*, 39(4), 859-868). The intentions of this report are to reinforce a standard set of conditions to be followed when choosing and implementing a particular capture technique, and to offer tips on how to minimize bird stress while in hand. The goal is to achieve maximum safety for the cranes and people involved, and keep capture-related morbidity to less than 2 percent.

Etiology of Capture Morbidity in Cranes

Musculoskeletal trauma and repercussions from severe physiological stress, often manifested as exertional myopathy or capture myopathy, are common negative impacts among captured cranes. With greater numbers of free-ranging whooping cranes subjected to direct manipulation, such harmful impacts are likely to arise with increasing frequency.

Capture and handling techniques should be designed to minimize the risks of direct trauma, as many complications and stressors are exacerbated by pre-existing tissue damage. Contingency plans must be available in the event of injury during capture/handling, including prompt treatment and potential rehabilitation.

Exertional myopathy (EM) is an insidious non-infectious disease that may present as an acute capture shock syndrome that develops within minutes to hours, or a debilitating, necrotizing muscle condition that takes days to manifest. The disease has been described in a wide array of mammals and birds. Long-legged birds may be more susceptible to EM than other birds as suggested by a disproportionate number of published case reports involving Mississippi sandhill cranes, greater sandhill cranes, whooping cranes, grey crowned cranes, emus, ostriches, a white stork, and greater and lesser flamingos.

Several factors are associated with the EM onset in animals, including fear, anxiety, stress, overexertion, hyperthermia, metabolic acidosis, and vitamin E/selenium deficiency. Genetic predisposition has also been suggested as a potential risk factor. Certain plant and chemical toxicants can induce disease similar to EM. Anthropogenic factors, such as capture and handling conditions, are recognized risk factors for EM, including rate and length of pursuit, prolonged manual restraint with extended muscle tension, repeated handling, and transportation and translocation of an exhausted animal. In addition, environmental conditions may aggravate the factors described above. High temperatures and captures in summer months have been associated with the EM development. Exertional myopathy may also develop secondary to severe trauma, but it is infrequently documented compared to the “classical capture and pursuit” disease.

Prevention of EM is paramount; there is generally a low rate of success in treating EM in wildlife, and perhaps whooping cranes in particular. Taken together, published accounts suggest that minimizing stress, prompt immobilization, proper restraint, efficient transportation, and limiting handling time are critical to preventing EM in susceptible species. It is assumed that similar steps would help prevent the disease in captured whooping cranes.

Proposed Guidelines for Preventing Capture Associated Morbidity

1. Pre-planning the Capture

To maximize safety, considerable time must be spent evaluating specific situations in which whooping cranes will be captured. A flexible timetable is desirable in situations involving significant distance or logistics to allow assembly of sufficient staff, arrange transportation and equipment.

Prior to capture, personnel need to investigate the site(s) used by the cranes and their behavioral routines and disposition. Health status, habitat use, timing of local movements, feeding or roosting and social behavior, and presence of other cranes may require considerable adjustment in capture techniques or equipment needed. Some situations may make capture difficult or impossible; therefore, flexibility is required in the techniques that may be applied.

All techniques, however, should limit the pursuit of the target bird(s), rapidly apply safe handling with proper restraint and leg positioning, minimize stressors and external stimuli once birds are in-hand, and prevent hyperthermia. Chemical methods must reach an adequate plane of anesthesia to prevent partial sedation and struggling.

Staffing requirements should be met with experienced personnel; handlers of free-ranging whooping cranes should have considerable practical experience handling captive or wild cranes in various conditions. The personnel should also be well trained with the techniques to be used and communicate and work together as a well-functioning team.

When birds are baited for capture, whole corn should be avoided to prevent possible aspiration. Pelleted food or cracked corn should be substituted at the time of capture. Food should be removed from the mouth if present after capture.

Capture should occur only when temperatures are below 75-80 degrees, typically before 1000 hours or towards evening, with due consideration to seasonal influences on bird behavior and condition. Hot and humid weather should result in postponement of capture, or significant modifications in technique such that turn-around time to release is extremely short (minutes).

Transportation of birds after capture needs to be planned carefully. Air conditioned, closed-top vehicles for local or regional transport and non-commercial airplanes for long distance translocations are ideal. Carefully coordinated timetables are needed to minimize the time spent in transport crates and keep stress under control. Currently, there are no sedatives tested that appear to ease handling or shipment.

While captures for relocation provide opportunities to change radio transmitters or take blood samples, field events may make such extra handling inadvisable. Final decision on such actions should be based on an assessment of the bird's condition and response to capture and handling. All necessary equipment and arrangements for the acquisition, storage and transport of biological samples must be secured prior to the target capture date.

Finally, a contingency plan in the event of injury must be formulated prior to capture. Contact with project veterinary staff prior to capture is useful in facilitating a timely response in the event of an emergency. It may be desirable to hand carry an injured crane, rather than transport it in a crate to avoid further injury.

2. Physical Restraint

Though initial immobilization of cranes may be facilitated by nets, snares or chemical methods, manual restraint is common to all capture protocols. The strategy for the restraint of each individual is unique, especially given the bird's size, behavioral disposition and health status.

Fundamental safe handling techniques are well described in chapters 2 & 5 of the Crane Husbandry Manual (*Cranes: Their Biology, Husbandry and Conservation*, Ellis, Gee & Mirande, 1996). The full text of the manual is accessible from the internet at:

<http://www.pwrc.usgs.gov/resshow/gee/cranbook/cranebook.htm>

Handling of cranes involves the following central tenets:

- Handlers should wear eye protection and long pants or other leg covering to prevent injuries from claws and bills.
- For manual capture of adults, two people are normally required. The handler may quickly grab the bustle (elongated tertial feathers), both wings or the humerus of one wing and the neck.
- Restrain the wings and legs as soon as possible after catching a crane by pulling the crane's body against captor's own and turning away from the bird's bill to avoid facial injury. A second person should restrain the crane's head and secure a hood on the bird to minimize stress and struggling. Hoods should be sized and shaped according to the species being restrained.
- Restrain legs with one arm while the body is held with the other. Legs should be restrained above the hocks with one finger between them to avoid abrasions. The lower limbs should be left unrestrained (hanging down/not folded) except to control obvious flailing and to guard against catching toes or nails in clothing. *Briefly* securing the lower limbs with masking tape or low-stick tape is advisable if limited movement is required.
- Move the crane to shade or other shelter.
- Sit and hold the bird in a comfortable position in the lap or place a foot on a chair or stool to ease resting the bird on the handler's thigh.
- Hold the bird's head away from hard objects to prevent striking them when struggling.
- If a manual release is performed, allow the limbs to touch the ground before letting go of the body or wings. The handler may elect to hold the bustle or one wing to be sure the crane is stable before release.
- Crane chicks are very fragile. Use a scoop method to handle young chicks where one or two fingers are slipped between the chick's legs and its body is held

gently in the palm, while the legs dangle between the fingers or over the side of the hand. The other hand covers the chick's back to prevent it from jumping off the palm. The legs are left unrestrained, but must be prevented from clawing the chick's face or neck.

- When releasing chicks, support the body until the legs support the bird's weight.
- Birds over 10 days old may be held by the bouquet method where the bird's weight is supported by one hand under the keel and the legs are held with the other with a finger between them. The bird's body is held horizontally or more upright with the legs back so the chick cannot claw itself.
- Restraint of older chicks must consider the emergence of new feathers. Chicks over six weeks of age are normally carried like small adults.
- It is highly recommended that all chicks are held with the legs in extension, rather than in a folded position to prevent injury.

3. Timing and Monitoring Cranes In-hand

Cranes should not be held any longer than necessary; time should be kept from the moment capture and restraint begins. Recommended maximum lengths of time for physical restraint of healthy cranes range from ~15-25 minutes for single bird capture, and slightly longer if multiple birds are processed simultaneously. Keeping the handling time to a minimum likely helps reduce stress, lowers the probability of overexertion, and helps to maintain group cohesion after release (if the bird was a member of a pair, family, or subadult group).

If time is limiting, tasks must be prioritized, with some abandoned if necessary. Information is collected quickly, using a standard form for data entry. It may be possible to accomplish some tasks simultaneously on single birds if personnel and conditions allow. Work could be organized assembly-line style if multiple birds are processed.

Open-mouth breathing (increased effort), increased respiratory rate, and overheating (legs warm to the touch) are all signs of stress and hyperthermia in birds which can lead to the serious complications described above. Handling must be cut short when these signs are observed. Hyperthermia can be counteracted by spraying or pouring cool water on the bird's legs, application of ice packs in the axillary and/or inguinal area between the extremities and body, and movement to a cooler environment (see chapter 8 in Crane Husbandry Manual).

4. Translocations

During all translocations, enclosed vehicles with air conditioning are most useful to mitigate the effects of heat stress or hyperthermia. Well ventilated crates are useful for all motor vehicle transfers, as well as aircraft-aided translocations. A guideline on crate sizes and materials appropriate for whooping cranes can be found in the Crane Husbandry Manual. Manual restraint is generally not recommended during transportation for relocation or other needs, except when the distance is considerably short.

Repeated bouts of handling are to be discouraged during translocation, except in the case of emergency treatment that is under the direction of a veterinarian. All translocations should be of the shortest duration possible, with contingency plans made in the event of delays (i.e., provision of food and water if greater than 2-4 hours).

5. Release and Follow-up

When possible, cranes are released close to water so the bird can quickly cool off and drink if needed. The capture team leaves the area quickly so that the birds can recover as soon as possible from the intrusion. Close monitoring of birds via telemetry or observation after release is highly desirable to determine short-term outcomes after capture and identify potential problems. A decision can then be made regarding intervention and treatment of the problems observed.

Personnel should meet soon after each capture event and debrief one another to encourage improvement in communications, techniques and results. Notes of these discussions should be logged and archived for potential later use.